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Architectural Drawings

Valuable Records Requiring TLC

In recent years, architectural drawings have become highly regarded for their aesthetic and historical content. The desire to collect and prize architectural drawings has ballooned and spurred preservation awareness for these materials. Organizations such as COPAR (Committee on the Preservation of Architectural Records) have been established in several states and U.S. cities since the 1970s to protect architectural records. Conferences, seminars, and workshops on the production, appraisal, accession, and care of architectural drawings and records have been held in countries across the globe. Research into materials used in fabrication of original architectural drawings and photo-reproductions (blueprints, diazotypes, van dyke prints, etc.) has grown, permitting a greater understanding of appropriate conservation treatment and preventive care.

Original architectural drawings and reproductions are often created from poor quality materials. Poor quality materials, extensive handling, and inappropriate storage affect the stability of these drawings. Proper storage and care will extend the life span of architectural records. The selection of suitable housing materials for storage requires identification of components used in the fabrication of original drawings and photo-reproductions. Several photo-reproductive processes are sensitive to alkali (such as blueprints) and risk damage when placed in contact with buffered interleaving materials. Ideal storage conditions require architectural drawings to be sorted by photo-reproductive process. Storage of different photo-reproductive processes together may have detrimental effects on the documents. For example, some materials used in the manufacture of diazotypes have the ability to affect alkaline-sensitive drawings and silver based photographic prints such as Photostats.[1] Valuable workshops to aid in identification of photo-reproductive processes have been held for archivists, librarians, and museum personnel. Verification of a photo-reproductive process may be provided by a conservator specializing in architectural drawings if identification is uncertain.

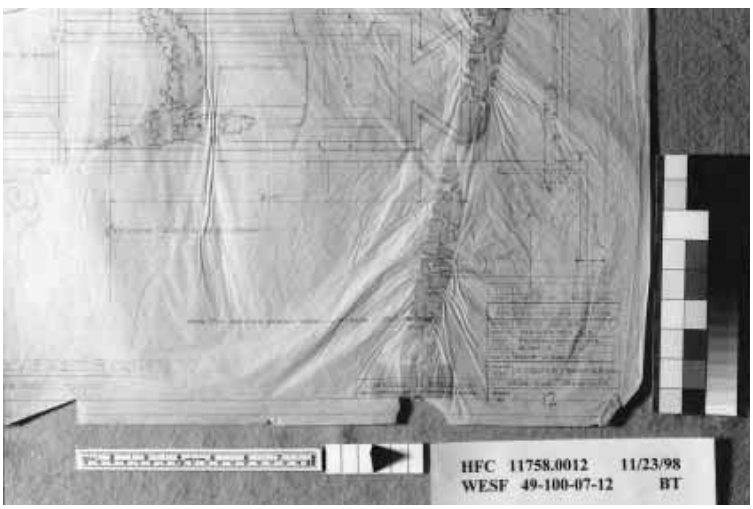
A one-year project focusing on the treatment of a collection of original architectural drawings belonging to the National Park Service is currently underway at the Division of Conservation at the Service's Harpers Ferry Center in West Virginia. The collection consists of 84 drawings of the White House completed prior to the extensive renovation that took place during President Harry Truman's second term in office. Renovation of the White House began in December 1949 and was completed in March 1952. This collection of measured drawings was created on-site over one year from August 1948 through August 1949, in anticipation of the changes the White House was slated to undergo. The drawings document floor plans, interior elevations, details, and ornamental embellishments of the White House as they existed prior to the renovation.

Lorenzo Winslow, architect of the White House during the renovation, supervised a team of seven architects to complete the drawings. A drafting room used by the architects was located in a temporary wooden building south of the Rose Garden during the renovation. Fifty years later, the collection of renovation drawings remains historically significant as a record of the White House as it existed in 1949.

Seventy-eight of the drawings are executed in graphite on tracing paper. Six of the drawings are on tracing cloth, five executed in graphite and black ink, and one a photo-reproductive process. Tracing paper and tracing cloth are transparent supports that were used for the rendition of master drawings since the 19th century. Copies of drawings on the transparent supports would be made using one of the various duplication processes. Tracing cloth was typically made from linen, and later cotton, coated with starch and calendared. Three of the tracing cloth drawings in this collection are coated with cellulose nitrate instead of starch.

Since the majority of drawings is executed on tracing paper, ample information was needed in dealing with these supports. The tracing papers in the collection differ in weight and color and are in various conditions. Some of the papers have aged and yellowed while others remain fairly white. Fiber analysis of several tracing paper samples reveal the papers to be made of cotton. Five of the drawings have a watermark indicating the fiber content is 100% rag.

Tracing paper is not always composed of cotton fiber; chemical wood pulp may also be used. A paper published in 1992 reported manufacturers' characterization of modern transparent papers and their fiber processing.[2] The two types of transparent supports associated with architectural drawings are natural tracing papers and prepared tracing papers. The natural tracing papers are extensively beaten during fiber processing. Increased fibrillation from beating increases the amount of fiber bonding. Transparency of the paper is increased when there is minimal interruption of light transmission through the sheet. Impregnants and coatings may be added during sheet processing to form prepared tracing papers. Among materials used to transparentize paper are starch, mineral oils, and acrylic films. Historical tracing papers were impregnated with oils, fat, waxes, varnishes, and resins.



Before treatment photograph of a measured graphite drawing on tracing paper. Lengths of pressure-sensitive tape applied to the reverse side of the drawing have caused staining and severe distortions of the paper. Photo by the author.

In addition to the conservation literature, various trade catalogs at the Harpers Ferry Center Library and National Museum of American History provided interesting information regarding transparent supports. A drawing material catalog printed in 1955 by the company Keuffel and Esser, listed for sale a natural tracing paper of 100% white rag stock and prepared tracing paper.[3] The catalog warns that the prepared tracing paper may be subject to some discoloration with age. Samples of available tracing papers were included in a number of historic trade catalogs, providing an excellent reference for examination.

The drawings in the collection vary greatly in size. The smallest drawing measures 20 inches x 27 inches and the largest measures 183 inches x 42 inches. Each drawing in this collection is in need of conservation treatment including surface-cleaning, mending of tears and losses, humidification, and flattening. All of the drawings appear to have been handled extensively—many were rolled and folded causing deep creases and edges that are especially weak, brittle, and vulnerable. Sixty-two of the drawings are in need of pressure-sensitive tape removal and/or adhesive staining reduction. Many of the drawings possess staining from pressure-sensitive tape adhesive that has transferred during direct contact with another drawing.

A survey was conducted to obtain additional information regarding current conservation treatment of tracing paper and then used to develop a conservation treatment plan for this drawing collection. A list of paper conservators was compiled from existing tracing paper conservation literature. The survey was mailed to 62 conservators in the United States, Canada, and Europe. Thirty-eight conservators responded to the survey, providing many helpful ideas and suggestions for treatment. Survey respondents frequently advised minimal intervention when treating tracing papers. Respondents emphasized conservators must be aware of the type of tracing paper being treated. Since prepared tracing paper is very different in composition from natural tracing paper, conservation treatment techniques will often differ from one paper to another. An organic solvent safely used to reduce pressure-sensitive adhesive residue on a natural tracing paper may have catastrophic effects on a prepared tracing paper. The organic solvent may reduce adhesive and remove the oil or resin in the prepared paper as well, rendering the paper opaque and reducing the transparency of the sheet, permanently altering its composition.

Stains are difficult to remove from tracing paper, particularly the pressure-sensitive adhesive tape stains. The barrage of organic (and often toxic) solvents required to reduce an adhesive stain do not always produce satisfactory results.

The disfiguring tape stain in the photo on page 41 will require approximately 10 hours of conservation treatment, including the application of heat, mechanical reduction of adhesive, solvent application to stabilize and reduce (but not completely remove) the tape stain, humidification, and flattening to minimize planar distortions in the sheet.

This brief description of the conservation treatment required for a damaged drawing from the collection illustrates why all aged tracing papers should be handled with care. Tracing paper is a fragile and tricky material, requiring delicate handling. All architectural drawings, regardless of support material, need special attention in order to retain their information and aesthetic composition.

Notes

1 Reed, Judith, Eléonore Kissel, and Erin Vigneau. "Photo-Reproductive Processes used in the Duplication of Architectural and Engineering Drawings: Creating Guidelines for Identification." *The Book and Paper Group Annual* 14 (1995): 41-49.

2 van der Reyden, Dianne, Christa Hofmann, and Mary Baker. "Some Effects of Solvents on Transparent Papers." The Institute of Paper Conservation: Conference Paper Sheila Fairbrass, 234-46 United Kingdom: G.W. Limited, 1992.

3 Keuffel and Esser Company. *Catalogue of Keuffel and Esser Company Manufacturers and Importers of Drawing Materials.* Hoboken, NJ: 1955.

References

Ehrenberg, Ralph. *Archives & Manuscripts: Maps and Architectural Drawings.* Chicago: Society of American Archivists, 1982.

Mass COPAR. Proceedings of the Symposium on the Appraisal of Architectural Records. Cambridge, 1987.

Nelb, Tawny Ryan. "Will Your Drawings Be There When You Need Them?" *Plan & Print* N64:12 (Dec.1991).

Price, Lois Olcott. "The History and Identification of Photo-Reproductive Processes used for Architectural Drawings Prior to 1930." *Topics in Photographic Conservation* 6 (1995): 41-49.

A comprehensive bibliography compiled in 1994 on conserving architectural drawings and oversize works of art on paper, by paper conservator Nancy Carlson Schrock, may be accessed via the internet at: http://palimpsest.stanford.edu/bib/

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Conservation Science in the Parks

Not Just for Natural Resources

Ask the general public what they know about conservation in the National Park Service and they will likely reply—"You mean saving trees, water, animals and the environment in the parks?" If one were to ask what a conservation scientist working for the Park Service does, the answer would probably be that such a scientist studies the parks' natural resources. Most would be surprised to learn that one Park Service conservation scientist has little or nothing to do with natural resources, but instead studies cultural resources.

The cultural resources conservation scientist has several roles:

- To provide information to park curators and interpretive staff to aid them in interpretation of an artifact
- To provide information to conservators to aid them in their decisions regarding object storage, exhibition, and conservation treatment
- To carry out research projects related to the technology or provenance of museum artifacts, studies on mechanisms of deterioration of such artifacts, systematic development of new conservation materials, and evaluations of the long-term efficacy of previous conservation treatments

Tools of the Conservation Scientist

Several tools commonly used by the conservation scientist for examining or analyzing artifacts are infrared spectroscopy, optical microscopy, and ultraviolet-visible spectroscopy.

Fourier-transform infrared spectroscopy (FT-IR) is one of the most important tools of the conservation scientist. It can be used not only to